

ABSTRACT

A system for non-invasively monitoring pressure and/or pressure gradients in a cardiac conduit is provided. This system includes one or more implantable sensing devices, and a non-implantable readout device. The implantable sensing device has an inductor and capacitor with an option of having electronic components, as well as a mechanism for anchoring the device inside the patients' body. The external readout device allows electromagnetic telecommunication and wireless powering of the implanted sensor. Data transmitted from the implantable device may include pressure, temperature, calibration data, identification data, fluid flow rate, chemical concentration, and/or other physiologic parameters.

The batteryless, wireless pressure sensor unit(s) is chronically located within the conduit. For valveless conduits, one or more sensors are placed at either end of the conduit. For valved conduits, a sensor is located both proximal and distal to the valve, allowing the pressure gradient across the valve to be monitored. One sensor can indicate occlusion; however, two sensors will allow the occlusion to be located (e.g. proximal/middle/distal along the conduit). As well, with two sensors, flow rates may be deduced or estimated. Furthermore, trend analysis of the pressures and/or flow rate within the conduit can allow a time-to-failure estimate.